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(54) STRETCHED FILM FOR WRAPPING FOOD

(57)Abstract:
PROBLEM TO BE SOLVED: To obtain a non-vinyl chloride resin stretched film good in wrapping workability and wrapped finish.
SOLUTION: This stretched film for wrapping foods has at least one of layers containing the below-described components (A) and (B), having a frequency of 10Hz by the measurement of dynamic viscoelasticity, a storage elastic modulus (E') of 5.0 × 108 to 5.0 × 109dyn/cm2 measured at a temperature of 20° C, and a loss tangent (tan δ) of 0.2-0.8. (A) One or more kinds of propylenic polymers having a crystallization calorie of 10J/g to 60J/g measured with a differential scanning calorimeter, when cooled down to 0° C at a scanning rate of 10° C/min, after the crystals are melted. (B) A petroleum resin, a terpene resin, a chromane-indene resin, a rosin resin, or their hydrogenation derivatives.

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CLAIMS

[Claim(s)]
[Claim 1] The stretch film for food packing characterized by 5.0x108 - 5.0x109 dyn/cm2, and a loss tangent (tandelta) having the storage modulus (E') which has further a layer containing following (A) and (B) component at least, and was measured at the frequency of 10Hz, and the temperature of 20 degrees C by dynamic viscoelasticity measurement in the range of 0.2-0.8.
(A) Independent or the propylene system polymer whose amount of heat of crystallization when lowering the temperature to 0 degree C by part for after [crystal fusion] scan speed/of 10 degrees C measured with the differential scanning calorimeter it is two or more sorts of mixture, and is 10 J/g - 60 J/g of a propylene system polymer.
(B) Petroleum resin, terpene resin, coumarone-indene resin, rosin system resin, or those hydrogenation derivatives [claim 2] The storage modulus (E') of the film measured at the frequency of 10Hz and the temperature of 0 degree C by dynamic viscoelasticity measurement is 1.5x1010 dyn/cm2. Stretch film for food packing according to claim 1 characterized by being in the following range.
[Claim 3] Petroleum resin, terpene resin, coumarone-indene resin, rosin system resin, or the stretch film for food packing according to claim 1 or 2 characterized by being in the range whose glass transition temperature of those hydrogenation derivatives is 50-100 degrees C.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the stretch film used for food packing, especially the stretch film which consists of an ingredient which does not contain chlorine.
[0002]
[Description of the Prior Art] As a stretch film for the so-called prepackaging which garden stuff, prime meat, a daily dish, etc. are put on a lightweight tray from the former, and is overlapped with a film, the thing of a polyvinyl chloride system has mainly been used. this has good package effectiveness and a package result is also beautiful -- etc. -- it is because it has the predominance of the quality which the both sides of the vender that commodity value does not fall, and a consumer were permitted, such as excelling in the elastic-recovery force return even if it adds deformation of pushing the film after a pack besides package fitness with a finger, and bottom seal nature being also good and being hard to generate film peeling during transportation exhibition.
[0003]
[Problem(s) to be Solved by the Invention] However, the hydrogen chloride gas which occurs to the film of a polyvinyl chloride in recent years at the time of incineration, the elution of a plasticizer contained so much have been regarded as questionable. For this reason, the ingredient which replaces a polyvinyl chloride system film is examined variously, and the various proposals of the stretch film of the configuration especially using polyolefine system resin are made. For example, the stretch film of configurations, such as an ethylene-vinylacetate copolymer (EVA), EVA / polybutene-1-/EVA, and EVA / straight chain-like ethylene-alpha olefin copolymer / EVA, is proposed. However, it is difficult to satisfy all properties, such as package workability, a package result, elastic recovery force, and bottom seal nature.
[0004]
[Means for Solving the Problem] this invention persons succeed in obtaining the non-vinyl chloride system stretch film excellent in many above-mentioned properties wholeheartedly as a result of examination. The summary It has further a layer containing following (A) and (B) component at least. By dynamic viscoelasticity measurement The frequency of 10Hz, It is in the stretch film for food packing characterized by 5.0x108 - 5.0x109 dyn/cm2, and a loss tangent (tandelta) having the storage modulus (E') measured at the temperature of 20 degrees C in the range of 0.2-0.8.
[0005] (A) Independent or the propylene system polymer whose amount of heat of crystallization when lowering the temperature to 0 degree C by part for after [crystal fusion] scan speed/of 10 degrees C measured with the differential scanning calorimeter it is two or more sorts of mixture, and is 10 J/g - 60 J/g of a propylene system polymer.
(B) Petroleum resin, terpene resin, coumarone-indene resin, rosin system resin, or those hydrogenation derivatives [0006]
[Embodiment of the Invention] Hereafter, this invention is explained in detail. this invention stretch film has further a mixed resin layer containing the above (A) and two components of (B) at least, and has specific viscoelastic property as the whole film.

[0007] (A) the propylene system polymer which is a component -- a propylene -- more than 70 mol % -- it is resin to contain and polypropylene (homopolymer), a propylene, ethylene, copolymers with the alpha olefin of carbon numbers 4-12, or such mixture can be illustrated. Generally the propylene system polymer of reinforcement is expensive at high crystallinity, and in a polyolefine system polymer, comparatively, high-melting takes the big force at the time of expansion for high crystallinity, although thermal resistance is also good, and only uneven elongation is shown, but even if these properties become mixture, they remain. Therefore, in this invention, in order to obtain the good film of elongation, it is desirable to use the propylene system copolymer of comparatively low crystallinity for some propylene system polymers [at least]. as the copolymer in this case -- a propylene -- the alpha olefin of ethylene or carbon numbers 4-12 -- about 3-30 mol % -- what carried out copolymerization is suitable. Moreover, you may be two or more sorts of mixture, such as a crystalline propylene polymer and an amorphous propylene polymer (for example, atactic polypropylene).
[0008] That it can apply to this invention can attain the below-mentioned viscoelastic property, when it mixes with the aforementioned (B) component, and it is the propylene system polymer of comparatively low crystallinity like the above-mentioned. When it measures with a differential scanning calorimeter (DSC) as a crystalline standard about the (A) component which consists of independent resin or two or more sorts of mixture, the amount of heat of crystallization when lowering the temperature to 0 degree C by part for after [crystal fusion] scan speed/of 10 degrees C is an ingredient in the range of 10J/g - 60 J/g, and is in the range of 20 - 50 J/g still more preferably.
[0009] The amount of heat of crystallization of crystallinity is too low in less than 10 J/g, film production nature is very bad, and also in ordinary temperature, a film is too soft, or reinforcement is insufficient and there is a problem practically. Moreover, in that by which the amount of heat of crystallization exceeds 60 J/g, the big force is required at the time of film expansion, and only uneven elongation is shown, and it is not suitable for a stretch film.
[0010] The property which this invention means is not acquired only of the (A) component here. Namely, generally the glass transition temperature of the propylene system polymer of the (A) component is -30 degrees C - 0 degree C, and its tandelta in 20 degrees C is as small as less than 0.1.
[0011] Then, in this invention, petroleum resin, terpene resin, coumarone-indene resin, rosin system resin, or those hydrogenation derivatives are mixed for the (A) component as a (B) component. (B) Glass transition temperature of a component is high and it raises the glass transition temperature of mixture. Moreover, while dissolving in the (A) component to detailed order and reducing the crystallinity, the stress behavior of the (A) component can also be changed, and the loss tangent (tandelta) which shows the storage modulus (E') which shows an extensibility suitable as a stretch film in ordinary temperature, and moderate stress relaxation nature can be reconciled.
[0012] As petroleum resin, it is a cyclopentadiene or the alicyclic petroleum resin from the dimer, and C9 among the (B) components here. There is aromatic series petroleum resin from a component, and the esterification rosin resin to which terpene resin and terpene-phenol resin from beta-pinene denaturalized with rosin resin, such as gum rosin and wood rosin, a glycerol, or pentaerythritol as rosin system resin again can be illustrated as terpene resin. Although comparatively good compatibility is shown when the above-mentioned (B) component is mixed for the (A) component, it is desirable to use a hydrogenation derivative from a color tone or fields, such as thermal stability and compatibility.
[0013] In addition, although that in which the (B) component mainly has various glass transition temperature with molecular weight is obtained, 50-100 degrees C of glass transition temperature of this invention being suited are a 70-90-degree C thing preferably. Although the crystallinity as a mixed resin constituent falls that glass transition temperature is less than 50 degrees C, it becomes difficult for an elastic modulus to become low too much and to acquire the below-mentioned viscoelastic property as the whole film.
[0014] Although the crystallinity of the (A) component remains if there are few additions, and the crystallinity as a mixed resin constituent will fall in that by which glass transition temperature

exceeds 100 degrees C on the other hand if the mixed effectiveness of the (B) component is small and makes [many] an addition, it becomes difficult with the rise of glass transition temperature to acquire the viscoelastic property which it becomes high, and an extensibility required as a stretch film and a low-temperature property are spoiled, and also mentions a modulus of elasticity later.

[0015] this invention film has the layer which mixed other resin in the range which uses as a principal component the layer which consists of the above (A) and a (B) component or (A), and the (B) component, and does not spoil transparency etc. to it.

[0016] this invention film has the storage modulus (E') measured at the frequency of 10Hz, and the temperature of 20 degrees C by dynamic viscoelasticity measurement in the range of 5.0x108 to 5.0x109 (dyn/cm2), and a loss tangent (tandelta) is in the range of 0.2-0.8. here -- E' -- 5.0x108 dyn/cm2 It is soft in it being the following, and to deformation, since stress is too small, workability is bad, and the flare of the film of a pack article does not have it, either, and it is not suitable as a stretch film. Moreover, E' is 5.0x109 dyn/cm2. If it exceeds, it will be hard, will become a pile film on elongation, and will be easy to produce deformation fellow blurring of a tray.

[0017] Moreover, since restoration behavior [as opposed to / that tandelta is less than 0.2 / the elongation of a film] is momentary, until it inserts a film into the bottom of a tray, while it is small, a film reverts, and it is easy to generate a wrinkling, without the ability stretching a film well. Moreover, since sufficient welding by heat does not do easily in the case of stretch packaging, the heat-sealing condition of a pars basilaris ossis occipitalis also becomes easy to produce peeling of a bottom seal after a package and during transportation thru/or exhibition gradually. Moreover, if tandelta exceeds 0.8, although the package result is good, plasticity-deformation is shown, the flare to the external force of a pack article is too weak, by the pile under transportation thru/or exhibition etc., the film on the top face of a tray tends to curtain, and commodity value tends to fall. Moreover, in an automatic package, for an elongation and cone reason, it is easy to produce the problem of a poor chuck perpendicularly. Especially the suitable range of tandelta is 0.30-0.60.

[0018] Moreover, for a stretch film, the storage modulus (E') of the film measured at the frequency of 10Hz and the temperature of 0 degree C by dynamic viscoelasticity measurement for that purpose although it was desirable for the low-temperature property (especially elongation) to be excellent since it was used at the time of low temperature is 1.5x1010 dyn/cm2. It is desirable that it is in the following range. For that purpose, what is necessary is just to adjust the quality of the material, thickness, etc. of the mixing ratio of the (A) component and the (B) component, or other polymer layers which are combined with the mixed resin layer of the (A) component and the (B) component.

[0019] In order to make E' of this invention film, and tandelta into the above-mentioned range, most effectively and generally adjusting the mixed ratio of (A) and (B) both components should just set the mixed weight ratio of (A)/(B) to an outline 80 / 20 - 50/50.

[0020] According to this invention, the stretch film which consists of a mixture layer explained above is obtained, but a laminating can also be carried out to other non-vinyl chloride ingredient layers by request. As other resin layers, a polyolefine system polymer, a flexible styrene-butadiene elastomer, etc. are mentioned, and the stability of film production of a film, blocking resistance, adhesiveness, slipping nature, etc. can be given by carrying out a laminating to these.

[0021] As a polyolefine system polymer as a charge of a laminated wood, ionomers, such as low density polyethylene, super-low density polyethylene (copolymer of ethylene and an alpha olefin), an ethylene-vinylacetate copolymer (EVA), an ethylene-alkyl acrylate copolymer, an ethylene-alkyl methacrylate copolymer, an ethylene-acrylic-acid copolymer, an ethylene-methacrylic-acid copolymer, and low density polyethylene, a propylene system elastomeric material, etc. are suitable here.

[0022] EVA can be used suitably practically, for example and the thing for 0.2-2g / 10 minutes (190 degrees C, 2.16kg load) is preferably suitable for melt flow REISHIYO (MFR) ten to 20% of the weight for a vinyl acetate content in respect of reinforcement, flexibility, film fabrication

nature, etc. five to 25% of the weight as this EVA. in addition, the range where the thickness of this invention film is generally used as a usual object for stretch packaging -- that is, about 8-30 micrometers are in the range of about 10-20 micrometers typically.
[0023] this invention film is obtained by fabricating an ingredient in the shape of a film with melting extrusion, inflation molding, or T-die shaping from an extruder. When considering as a laminated film, co-extruding with a multilayer die is advantageous. It is desirable that carry out melting extrusion of the ingredient resin, and it carries out inflation molding from an annular die practical, as for the blow up ratio in that case (the diameter of a bubble / diameter of a die), four or more are desirable, and especially the range of 5-7 is suitable for it.
[0024] On this invention film, in order to give engine performance, such as fog resistance, antistatic nature, and slipping nature, various additives can be added. For example, surfactants, such as a glycerine fatty acid ester, polyglyceryl fatty acid ester, a sorbitan fatty acid ester, and an ethyleneoxide addition product, can be added suitably.
[0025]
[Example] Below according to an example, effectiveness of this invention is clarified. In addition, the following approach measured and estimated the property and engine performance of a film.
1) It measured about the longitudinal direction of a film using E' and tandelta Iwamoto Factory viscoelasticity spectrometer VES-F3 at the oscillation frequency of 10Hz, the temperature of 20 degrees C, and 0 degree C.
[0026] 2) Using the stretch film with a stretch packaging fitness width of face of 350mm, the form polystyrene tray (die length of 200mm, width of face of 130mm, height of 30mm) was packed with the automatic packer (ISHIDA-Wmin MK-II made from the Ishida ****), and it evaluated about the item shown in Table 3. Moreover, the hand packaging machine (diamond wrapper A-105 by Mitsubishi Plastics Industries [, Ltd.], Ltd.) performed the package trial using the same film and the same tray.
[0027] 3) The stability of the bubble at the time of fabricating a film with a stability inflation film production facility of film production was evaluated.
O Extremely stable O stable ** -- a little unstable x the film production improper amount PerkinElmer, Inc. make of 4 heat of crystallization -- the amount of heat of crystallization at the time of a temperature fall was measured on the following conditions using DSC-7.
Temperature conditions: -50 degrees C (maintenance during 1 minute) -> 200degree-C (maintenance during 1 minute) -> -40 degrees C (maintenance during 1 minute)
Scan speed: A part for 10-degree-C/ [0028] (Example 1)
(A) Component Low crystallinity propylene-ethylene-propylene copolymerization elastomer (Tokuyama and propylene content MFR[of 88 mols / % and 230 degree-C] =1.5g /, 10-minute, and PER[by the stock company] T-310 J) : 70-% of the weight (B) component The hydrogenation derivative of cyclopentadiene system petroleum resin (glass transition temperature of 81 degrees C, softening temperature of 125 degrees C) the mixed resin constituent 100 weight section of :30-% of the weight or more two component -- receiving -- as an antifogger -- diglycerol -- mono--- me -- the - TO 1.5 weight section -- melting kneading -- carrying out -- inflation molding The film with a thickness of 15 micrometers was obtained.
[0029] In addition, property measured with (A) component simple substance Storage-modulus E' in 2 20 degree C of storage-modulus E' 3.6x109 dyn/cm in 0 degree C 2.1x109 dyn/cm2 Loss tangent tandelta in 20 degrees C 0.07 Glass transition temperature -25 degrees C The amount of heat of crystallization 31 It was J/g.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the stretch film used for food packing, especially the stretch film which consists of an ingredient which does not contain chlorine.

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PRIOR ART

[Description of the Prior Art] As a stretch film for the so-called prepackaging which garden stuff, prime meat, a daily dish, etc. are put on a lightweight tray from the former, and is overlapped with a film, the thing of a polyvinyl chloride system has mainly been used. this has good package effectiveness and a package result is also beautiful -- etc. -- it is because it has the predominance of the quality which the both sides of the vender that commodity value does not fall, and a consumer were permitted, such as excelling in the elastic-recovery force return even if it adds deformation of pushing the film after a pack besides package fitness with a finger, and bottom seal nature being also good and being hard to generate film peeling during transportation exhibition.

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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention stretch film, when it is used for an automatic packer etc., a cut and conveyance, and wrapping of a film can be performed satisfactory, good, the flare of a film can acquire a good package object and bottom seal nature has the description it is featureless to the former as a non-vinyl chloride system stretch film.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, the hydrogen chloride gas which occurs to the film of a polyvinyl chloride in recent years at the time of incineration, the elution of a plasticizer contained so much have been regarded as questionable. For this reason, the ingredient which replaces a polyvinyl chloride system film is examined variously, and the various proposals of the stretch film of the configuration especially using polyolefine system resin are made. For example, the stretch film of configurations, such as an ethylene-vinylacetate copolymer (EVA), EVA / polybutene-1-/EVA, and EVA / straight chain-like ethylene-alpha olefin copolymer / EVA, is proposed. However, it is difficult to satisfy all properties, such as package workability, a package result, elastic recovery force, and bottom seal nature.

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MEANS

[Means for Solving the Problem] this invention persons succeed in obtaining the non-vinyl chloride system stretch film excellent in many above-mentioned properties wholeheartedly as a result of examination. The summary It has further a layer containing following (A) and (B) component at least. By dynamic viscoelasticity measurement The frequency of 10Hz, It is in the stretch film for food packing characterized by 5.0x108 - 5.0x109 dyn/cm2, and a loss tangent (tandelta) having the storage modulus (E') measured at the temperature of 20 degrees C in the range of 0.2-0.8.
[0005] (A) Independent or the propylene system polymer whose amount of heat of crystallization when lowering the temperature to 0 degree C by part for after [crystal fusion] scan speed/of 10 degrees C measured with the differential scanning calorimeter it is two or more sorts of mixture, and is 10 J/g - 60 J/g of a propylene system polymer.
(B) Petroleum resin, terpene resin, coumarone-indene resin, rosin system resin, or those hydrogenation derivatives [0006]
[Embodiment of the Invention] Hereafter, this invention is explained in detail. this invention stretch film has further a mixed resin layer containing the above (A) and two components of (B) at least, and has specific viscoelastic property as the whole film.
[0007] (A) the propylene system polymer which is a component -- a propylene -- more than 70 mol % -- it is resin to contain and polypropylene (homopolymer), a propylene, ethylene, copolymers with the alpha olefin of carbon numbers 4-12, or such mixture can be illustrated. Generally the propylene system polymer of reinforcement is expensive at high crystallinity, and in a polyolefine system polymer, comparatively, high-melting takes the big force at the time of expansion for high crystallinity, although thermal resistance is also good, and only uneven elongation is shown, but even if these properties become mixture, they remain. Therefore, in this invention, in order to obtain the good film of elongation, it is desirable to use the propylene system copolymer of comparatively low crystallinity for some propylene system polymers [at least]. as the copolymer in this case -- a propylene -- the alpha olefin of ethylene or carbon numbers 4-12 -- about 3-30 mol % -- what carried out copolymerization is suitable. Moreover, you may be two or more sorts of mixture, such as a crystalline propylene polymer and an amorphous propylene polymer (for example, atactic polypropylene).
[0008] That it can apply to this invention can attain the below-mentioned viscoelastic property, when it mixes with the aforementioned (B) component, and it is the propylene system polymer of comparatively low crystallinity like the above-mentioned. When it measures with a differential scanning calorimeter (DSC) as a crystalline standard about the (A) component which consists of independent resin or two or more sorts of mixture, the amount of heat of crystallization when lowering the temperature to 0 degree C by part for after [crystal fusion] scan speed/of 10 degrees C is an ingredient in the range of 10J/g - 60 J/g, and is in the range of 20 - 50 J/g still more preferably.
[0009] The amount of heat of crystallization of crystallinity is too low in less than 10 J/g, film production nature is very bad, and also in ordinary temperature, a film is too soft, or reinforcement is insufficient and there is a problem practically. Moreover, in that by which the amount of heat of crystallization exceeds 60 J/g, the big force is required at the time of film

expansion, and only uneven elongation is shown, and it is not suitable for a stretch film.
[0010] The property which this invention means is not acquired only of the (A) component here. Namely, generally the glass transition temperature of the propylene system polymer of the (A) component is -30 degrees C - 0 degree C, and its tandelta in 20 degrees C is as small as less than 0.1.
[0011] Then, in this invention, petroleum resin, terpene resin, coumarone-indene resin, rosin system resin, or those hydrogenation derivatives are mixed for the (A) component as a (B) component. (B) Glass transition temperature of a component is high and it raises the glass transition temperature of mixture. Moreover, while dissolving in the (A) component to detailed order and reducing the crystallinity, the stress behavior of the (A) component can also be changed, and the loss tangent (tandelta) which shows the storage modulus (E') which shows an extensibility suitable as a stretch film in ordinary temperature, and moderate stress relaxation nature can be reconciled.
[0012] As petroleum resin, it is a cyclopentadiene or the alicyclic petroleum resin from the dimer, and C9 among the (B) components here. There is aromatic series petroleum resin from a component, and the esterification rosin resin to which terpene resin and terpene-phenol resin from beta-pinene denaturalized with rosin resin, such as gum rosin and wood rosin, a glycerol, or pentaerythritol as rosin system resin again can be illustrated as terpene resin. Although comparatively good compatibility is shown when the above-mentioned (B) component is mixed for the (A) component, it is desirable to use a hydrogenation derivative from a color tone or fields, such as thermal stability and compatibility.
[0013] In addition, although that in which the (B) component mainly has various glass transition temperature with molecular weight is obtained, 50-100 degrees C of glass transition temperature of this invention being suited are a 70-90-degree C thing preferably. Although the crystallinity as a mixed resin constituent falls that glass transition temperature is less than 50 degrees C, it becomes difficult for an elastic modulus to become low too much and to acquire the below-mentioned viscoelastic property as the whole film.
[0014] Although the crystallinity of the (A) component remains if there are few additions, and the crystallinity as a mixed resin constituent will fall in that by which glass transition temperature exceeds 100 degrees C on the other hand if the mixed effectiveness of the (B) component is small and makes [many] an addition, it becomes difficult with the rise of glass transition temperature to acquire the viscoelastic property which it becomes high, and an extensibility required as a stretch film and a low-temperature property are spoiled, and also mentions a modulus of elasticity later.
[0015] this invention film has the layer which mixed other resin in the range which uses as a principal component the layer which consists of the above (A) and a (B) component or (A), and the (B) component, and does not spoil transparency etc. to it.
[0016] this invention film has the storage modulus (E') measured at the frequency of 10Hz, and the temperature of 20 degrees C by dynamic viscoelasticity measurement in the range of 5.0x108 to 5.0x109 (dyn/cm2), and a loss tangent (tandelta) is in the range of 0.2-0.8. here -- E' -- 5.0x108 dyn/cm2 It is soft in it being the following, and to deformation, since stress is too small, workability is bad, and the flare of the film of a pack article does not have it, either, and it is not suitable as a stretch film. Moreover, E' is 5.0x109 dyn/cm2. If it exceeds, it will be hard, will become a pile film on elongation, and will be easy to produce deformation fellow blurring of a tray.
[0017] Moreover, since restoration behavior [as opposed to / that tandelta is less than 0.2 / the elongation of a film] is momentary, until it inserts a film into the bottom of a tray, while it is small, a film reverts, and it is easy to generate a wrinkling, without the ability stretching a film well. Moreover, since sufficient welding by heat does not do easily in the case of stretch packaging, the heat-sealing condition of a pars basilaris ossis occipitalis also becomes easy to produce peeling of a bottom seal after a package and during transportation thru/or exhibition gradually. Moreover, if tandelta exceeds 0.8, although the package result is good, plasticity-deformation is shown, the flare to the external force of a pack article is too weak, by the pile under transportation thru/or exhibition etc., the film on the top face of a tray tends to curtain,

and commodity value tends to fall. Moreover, in an automatic package, for an elongation and cone reason, it is easy to produce the problem of a poor chuck perpendicularly. Especially the suitable range of tandelta is 0.30-0.60.
[0018] Moreover, for a stretch film, the storage modulus (E') of the film measured at the frequency of 10Hz and the temperature of 0 degree C by dynamic viscoelasticity measurement for that purpose although it was desirable for the low-temperature property (especially elongation) to be excellent since it was used at the time of low temperature is 1.5x1010 dyn/cm2. It is desirable that it is in the following range. For that purpose, what is necessary is just to adjust the quality of the material, thickness, etc. of the mixing ratio of the (A) component and the (B) component, or other polymer layers which are combined with the mixed resin layer of the (A) component and the (B) component.
[0019] In order to make E' of this invention film, and tandelta into the above-mentioned range, most effectively and generally adjusting the mixed ratio of (A) and (B) both components should just set the mixed weight ratio of (A)/(B) to an outline 80 / 20 - 50/50.
[0020] According to this invention, the stretch film which consists of a mixture layer explained above is obtained, but a laminating can also be carried out to other non-vinyl chloride ingredient layers by request. As other resin layers, a polyolefine system polymer, a flexible styrene-butadiene elastomer, etc. are mentioned, and the stability of film production of a film, blocking resistance, adhesiveness, slipping nature, etc. can be given by carrying out a laminating to these.

[0021] As a polyolefine system polymer as a charge of a laminated wood, ionomers, such as low density polyethylene, super-low density polyethylene (copolymer of ethylene and an alpha olefin), an ethylene-vinylacetate copolymer (EVA), an ethylene-alkyl acrylate copolymer, an ethylene-alkyl methacrylate copolymer, an ethylene-acrylic-acid copolymer, an ethylene-methacrylic-acid copolymer, and low density polyethylene, a propylene system elastomeric material, etc. are suitable here.
[0022] EVA can be used suitably practically, for example and the thing for 0.2-2g / 10 minutes (190 degrees C, 2.16kg load) is preferably suitable for melt flow REISHIYO (MFR) ten to 20% of the weight for a vinyl acetate content in respect of reinforcement, flexibility, film fabrication nature, etc. five to 25% of the weight as this EVA. in addition, the range where the thickness of this invention film is generally used as a usual object for stretch packaging -- that is, about 8-30 micrometers are in the range of about 10-20 micrometers typically.
[0023] this invention film is obtained by fabricating an ingredient in the shape of a film with melting extrusion, inflation molding, or T-die shaping from an extruder. When considering as a laminated film, co-extruding with a multilayer die is advantageous. It is desirable that carry out melting extrusion of the ingredient resin, and it carries out inflation molding from an annular die practical, as for the blow up ratio in that case (the diameter of a bubble / diameter of a die), four or more are desirable, and especially the range of 5-7 is suitable for it.
[0024] On this invention film, in order to give engine performance, such as fog resistance, antistatic nature, and slipping nature, various additives can be added. For example, surfactants, such as a glycerine fatty acid ester, polyglyceryl fatty acid ester, a sorbitan fatty acid ester, and an ethyleneoxide addition product, can be added suitably.
[0025]

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

EXAMPLE

[Example] Below according to an example, effectiveness of this invention is clarified. In addition, the following approach measured and estimated the property and engine performance of a film.
1) It measured about the longitudinal direction of a film using E' and tandelta Iwamoto Factory viscoelasticity spectrometer VES-F3 at the oscillation frequency of 10Hz, the temperature of 20 degrees C, and 0 degree C.
[0026] 2) Using the stretch film with a stretch packaging fitness width of face of 350mm, the form polystyrene tray (die length of 200mm, width of face of 130mm, height of 30mm) was packed with the automatic packer (ISHIDA-Wmin MK-II made from the Ishida ****), and it evaluated about the item shown in Table 3. Moreover, the hand packaging machine (diamond wrapper A-105 by Mitsubishi Plastics Industries [, Ltd.], Ltd.) performed the package trial using the same film and the same tray.
[0027] 3) The stability of the bubble at the time of fabricating a film with a stability inflation film production facility of film production was evaluated.
O Extremely stable O stable ** -- a little unstable x the film production improper amount PerkinElmer, Inc. make of 4 heat of crystallization -- the amount of heat of crystallization at the time of a temperature fall was measured on the following conditions using DSC-7.
Temperature conditions: -50 degrees C (maintenance during 1 minute) -> 200degree-C (maintenance during 1 minute) -> -40 degrees C (maintenance during 1 minute)
Scan speed: A part for 10-degree-C/ [0028] (Example 1)
(A) Component Low crystallinity propylene-ethylene-propylene copolymerization elastomer (Tokuyama and propylene content MFR[of 88 mols / % and 230 degree-C] =1.5g /, 10-minute, and PER[by the stock company] T-310 J) : 70-% of the weight (B) component The hydrogenation derivative of cyclopentadiene system petroleum resin (glass transition temperature of 81 degrees C, softening temperature of 125 degrees C) the mixed resin constituent 100 weight section of :30-% of the weight or more two component -- receiving -- as an antifogger -- diglycerol -- mono--- me -- the - TO 1.5 weight section -- melting kneading -- carrying out -- inflation molding The film with a thickness of 15 micrometers was obtained.
[0029] In addition, property measured with (A) component simple substance Storage-modulus E' in 2 20 degree C of storage-modulus E' 3.6x109 dyn/cm in 0 degree C 2.1x109 dyn/cm2 Loss tangent tandelta in 20 degrees C 0.07 Glass transition temperature -25 degrees C The amount of heat of crystallization 31 It was J/g.
[0030] (Example 2) As an interlayer, it is the mixed constituent of a propylene system copolymer and hydrogenation petroleum resin used in the example 1 as 11 micrometers and a front lining. the EVA(15 % of the weight [of vinyl acetate contents], 10 190-degree-CMFR=2.0g /, minutes) 100 weight section -- as an antifogger -- diglycerol -- mono--- me -- co-extrusion inflation molding of what allotted the layer of the constituent which kneaded the - TO 3.0 weight section 2 micrometers of each was carried out, and the film with a thickness [total] of 15 micrometers (2 micrometers / 11 micrometers / 2 micrometers) was obtained.
[0031] (Example 3) As an interlayer 70 % of the weight (Ube Rexene and CAP350 by 230-degree-CMFR=14g /, 10 minutes, and the stock company) of 50/50% of the weight of mixed constituents of crystalline polypropylene and an amorphous propylene-butene-1 copolymer, 30 %

of the weight [of hydrogenation petroleum resin used in the example 1] mixed resin -- as an antifogger -- diglycerol -- mono--- me -- the film with a thickness [total] of 15 micrometers (2/11/2micrometer) was obtained like the example 2 except having used the constituent which kneaded the - TO 1.5 weight section.
[0032] In addition, property measured with the CAP simple substance Storage-modulus E' in 2 20 degree C of storage-modulus E' 4.5x109 dyn/cm in 0 degree C 2.0x109 dyn/cm2 Loss tangent tandelta in 20 degrees C 0.11 Glass transition temperature -15 degrees C The amount of heat of crystallization 33 It was J/g.
[0033] Moreover, property measured about an interlayer's mixed constituent Storage-modulus E' in 2 20 degree C of storage-modulus E' 1.2x1010 dyn/cm in 0 degree C 2.0x109 dyn/cm2 Loss tangent tandelta in 20 degrees C 0.36 Glass transition temperature It was 0 degree C.
[0034] (Example 1 of a comparison) The film with a thickness [total] of 15 micrometers (2 micrometers / 11 micrometers / 2 micrometers) was obtained like the example 2 except having made into the interlayer the propylene system copolymer elastomer simple substance used in the example 2.
[0035] (Example 2 of a comparison) It replaced with the propylene system copolymer elastomer used in the example 2, and the film with a thickness [total] of 15 micrometers (2 micrometers / 11 micrometers / 2 micrometers) was obtained like the example 2 except having used the propylene-ethylene random copolymer (ethylene content MFR[of four mols / % and 230-degree-C] =0.5g /, 10 minutes). [0036] In addition, property measured with the propylene-ethylene random-copolymer simple substance Storage-modulus E' in 2 20 degree C of storage-modulus E' 1.7x1010 dyn/cm in 0 degree C 9.2x109 dyn/cm2 Loss tangent tandelta in 20 degrees C 0.06 Glass transition temperature -5 degrees C The amount of heat of crystallization 75 It was J/g.
[0037] Moreover, property measured about the interlayer who consists of a propylene-ethylene random copolymer and petroleum resin Storage-modulus E' in 2 20 degree C of storage-modulus E' 2.1x1010 dyn/cm in 0 degree C 9.0x109 dyn/cm2 Loss tangent tandelta in 20 degrees C 0.14 Glass transition temperature It was 10 degrees C.
[0038] (Example 3 of a comparison) As the middle class, the film with a thickness [total] of 15 micrometers (2/11/2micrometer) was obtained like the example 2 except having used the ethylene-butene-1 copolymer (super-low density polyethylene, 14 % of the weight of butene-1 contents, consistency 0.905) independently.
[0039] (Example 4 of a comparison) It evaluated about the commercial polyvinyl chloride stretch film (15 micrometers in thickness). The property about these films and the measurement evaluation result of the engine performance are shown in Tables 1-2.
[0040]
[Table 1]

表　1

	20℃		0℃	製膜
	E´	tanδ	E´	安定性
実施例1	2.0×10^{9}	0.35	9.0×10^{9}	△
実施例2	1.9×10^{9}	0.30	7.4×10^{9}	○
実施例3	2.0×10^{9}	0.32	8.2×10^{9}	◎
比較例1	2.0×10^{9}	0.08	3.6×10^{9}	○
比較例2	7.2×10^{9}	0.14	1.6×10^{10}	◎
比較例3	1.5×10^{9}	0.15	3.2×10^{9}	○
比較例4	1.9×10^{9}	0.35	5.5×10^{9}	−

[Table 2]

表　2

評価項目	手包装		自動機		共通				総合評価
	シワ	耐破れ	カット搬送	仕上り	底シール	復元性	張り	低温特性	
実施例1	◎	◎	◎	◎	◎	○	◎	○	◎
実施例2	◎	◎	◎	○	◎	◎	◎	◎	◎
実施例3	◎	○	◎	◎	◎	○	◎	◎	◎
比較例1	○	○	○	△	△	△	◎	◎	△
比較例2	×	◎	◎	×	×	×	○	×	×
比較例3	○	○	○	△	△	△	◎	◎	△
比較例4	◎	◎	◎	○	◎	◎	◎	◎	◎

[Table 3]

表 3

		評価方法	評価基準			
			×	△	○	◎
手包装	シワ	特にシワの発生し易いトレーコーナー部を評価	大きなシワが発生する	少しシワがある	僅かにシワがある	全くシワがない
	耐破れ	特に破れの発生し易いトレーコーナー部における破れ易さを評価	非常に破れ易い	やや破れ易い	時々破れることがある	ほとんど破れない
自動機	カット搬送性	カット時の切断面のカールや、搬送時のチャック状態を評価	カット搬送が出来ない	やや問題あり	まあまあである	全く問題ない
	仕上り適性	包装条件（[illegible]）を25水準に変え良好な水準数率を評価	0／25 ～ 3／25	4／25 ～ 10／25	11／25 ～ 15／25	16／25 ～ 25／25
共通	底シール性	熱板温度 100℃とし、包装後のシール状態を評価	熱による穴があったり、剥がれ易い	やや剥がれが生じる	僅かに剥れが生ずる	通常の取扱いでは剥れない
	復元性	パック品の中央部を指で底まで押した後の指の押跡の状況を評価	完全に押跡が残る	かなり押跡が残る	僅かに押跡が残る	完全に復元する
	フィルムの張り	パック品の上面を手で押さえた時の反発性や積み重ね時のたるみを評価	張りが弱すぎてたよりなく、たるみも生じる	かなり張りが弱い	やや張りが弱い	張りが良く反発性も良い
	低温特性	5℃雰囲気で包装したときの破れ易さやトレーの変形を評価	フィルムも破れが生じトレーも変形する	フィルム[illegible]トレーの変形が生じやすい	フィルム[illegible]トレーの変形が時々生ずる	問題ない

[0041] The film of an example 1 becomes a low crystallinity propylene system polymer from the layer which mixed the hydrogenation article of petroleum resin, and there is viscoelastic property within limits specified by this invention, and it was excellent in many properties. Moreover, although the film of examples 2-3 was a laminated film with EVA, it had the similarly excellent property.

[0042]

[Translation done.]